

Claims

1. An electrochemical device for moving particles covered with a protein, characterized in that said device has at least n ($n \geq 2$) pieces of electrodes contacting with a liquid containing particles covered with a protein and a circuit generating a potential difference between said electrodes in a range such that it does not cause the electrolysis of said liquid, said device allowing said particles move by electrophoresis in the aligned direction of said electrodes.

2. The electrochemical device in accordance with claim 1, wherein said circuit sweepingly applies a voltage in a range such that it does not cause the electrolysis of said liquid to said n pieces of electrodes sequentially in a constant direction, and moves said particles by electrophoresis in said direction.

3. The electrochemical device in accordance with claim 2, wherein said particles covered with a protein are microorganisms and/or blood cell components, said device giving a liquid having a condensed concentration of the microorganisms and/or blood cell components.

4. The electrochemical device in accordance with claim 3, having a structure allowing said liquid flow across said electrodes and the direction of voltage application to said respective electrodes is perpendicular

to the flow direction of said liquid.

5. The electrochemical device in accordance with claim 3, wherein said electrodes are vortex-type electrodes and said electrodes are disposed so as to extend to the same central point from the outer end portions to the inner end portions of said electrodes without overlapping each other.

6. The electrochemical device in accordance with claim 3, wherein said electrodes are spiral electrodes and said electrodes are disposed so as to extend from the upper end portions to the lower end portions of said electrodes without overlapping each other.

7. The electrochemical device in accordance with claim 3, wherein said electrodes are sheet-shaped porous electrodes and said device is provided with a wound type electrode, which is obtained by stacking n ($n \geq 3$) pieces of laminates, each comprising said sheet-shaped porous electrode and a sheet-shaped porous spacer in the order of said electrode and spacer and by winding said stacked laminates.

8. An electrochemical device for moving particles covered with a protein, wherein said n pieces of electrodes have oxidation/reduction potentials different from each other, and said circuit is one short-circuiting said n pieces of electrodes to move said particles by electrophoresis in the aligned direction of said electrodes.

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9. The electrochemical device in accordance with claim 8, wherein said particles covered with a protein are microorganisms and/or blood cell components, said device giving a liquid having a condensed concentration of the microorganisms and/or blood cell components.

10. The electrochemical device in accordance with claim 9, wherein an introduction portion and a discharge portion for said liquid are provided in the vicinity of an electrode having a higher oxidation/reduction potential, and a microorganism discharge portion and/or a microorganism adsorption portion are provided in the vicinity of an electrode having a lower oxidation/reduction potential.

11. The electrochemical device in accordance with claim 9, wherein an electrically insulating structural member through which said liquid moves is disposed in the space between said electrodes.

12. The electrochemical device in accordance with claim 11, wherein an electrode other than one having the lowest oxidation/reduction potential has a structure capable of allowing said liquid to flow into said space.

13. The electrochemical device in accordance with claim 12, wherein said structure has a porous, mesh or brush form.

14. The electrochemical device in accordance with claim 11, wherein an electrode other than one having the

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lowest oxidation/reduction potential has the form of a film, through which the microorganisms and/or blood cell components contained in said liquid transmit, and is stacked on the surface of said electrically insulating structural member.

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